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[Name of Document] SPECIFICATION

[Title of the Invention] SELECTIVE RADIO PAGING RECEIVER

[Claims]

5 [Claim 1] A selective radio paging receiver for receiving a message signal which follows a selective call signal of oneself, notifies the reception, and displays the contents of the message signal, said receiver comprising:

 a memory for storing the received message;

 automatic reset means and manual reset means for stopping the
10 notification of the reception;

 memory control means for, if the notification of the reception has been stopped by said automatic reset means, adding an attribute which indicates that the messages is an unread message to the message and storing the unread or already read message with a
15 reception time to said memory;

 list display control means for displaying a plurality of both the unread messages with the attributes and the respective reception time and the already read messages with respective reception time in a list of a reverse order of the reception time.

20 [Claim 2] The selective radio paging receiver as set forth in claim 1, further comprising:

 scroll means for selecting any one of the unread messages with the attributes and the already read messages, together with the reception time thereof, from the unread message, the already read messages and
25 respective reception times.

 [Claim 3] The selective radio paging receiver as set forth in claim 1,

 wherein said list display control means displays the unread messages with respective attributes and the already read messages,

together with respective reception time, in parallel in the list.

5 【Claim 4】 The selective radio paging receiver as set forth in claims 1 and 2,

 wherein said list display control means displays the unread messages with respective attributes and the already read messages in the list, and displays one unread message with its attribute or one already read message which has been selected by said scroll means.

 【Claim 5】 The selective radio paging receiver as set forth in claims 1 and 2, further comprising:

10 enlarged display control means for displaying, with changed character size, one unread message with its attribute or one already read message which has been selected by said scroll means from the plurality of unread messages and already read messages displayed by said list display control means.

15 【Claim 6】 The selective radio paging receiver as set forth in claim 5,

 wherein said enlarged display means displays the enlarged unread message or the enlarged already read message in a plurality of lines,

20 wherein the reception time is displayed, without being enlarged, in a distinct area from the unread message and the already read message.

 【Claim 7】 The selective radio paging receiver as set forth in claims 1 and 5,

25 wherein, when the enlarged unread messages is selected from the plurality of unread messages with respective attributes and the already read messages which are displayed by said list display control means and displayed, the attribute is removed from said memory and the selected messages is stored as an already read message.

 【Detailed Description of the Invention】

【0001】

【Field of the Invention】

The present invention relates to a selective radio paging receiver and particularly, to its display function for received messages.

5 【0002】

【Prior Art】

Conventionally, selective radio paging receivers (hereinafter, referred to as receivers if necessary) preserve past paging contents (dates, messages and so forth), read out and display them in the order
10 of reception. Accessed messages and non-accessed messages are mixed on a display unit. Therefore, it takes time and is annoying to select one of the non-accessed messages or the messages which have not yet been accessed and confirm their contents, particularly in selective radio paging receiver with large capacity memory.

15 【0003】

On the other hand, it is expected to read out and display easily the non-accessed messages, because messages which are transmitted toward radio paging receivers are often urgent and important.

【0004】

20 In order to meet such demands, there is disclosed in Tokkaihei 6-77880 a selective call radio receiver with a display function, which has a function of judging whether each stored message has been read or not and reading and displaying the unread messages, a function of displaying all the unread messages for a predetermined time, a
25 function of listing the unread messages while attaching the reception time thereto, and a function of displaying parts of the contents of the message with the reception time, whereby the easy operation of reading out the unread messages are realized and the accurate and easy judgment of the priority and importance of the messages is

realized.

[0005]

[Problem to be Solved by the Invention]

However, because the selective call radio receiver with a display
5 function, has a function of judging whether each stored message has
been read or not and reading and displaying the unread messages, a
function of displaying all the unread messages for a predetermined
time, a function of listing the unread messages while attaching the
reception time thereto, and a function of displaying parts of the
10 contents of the message with the reception time, the easy operation of
reading out the unread messages are realized and the accurate and
easy judgment of the priority and importance of the messages is
realized. However, the already read messages cannot read easily
with priority.

15 [0006]

There are some important messages among the already read-out
messages or un-accessed messages, for example, in case of receiving
information such as currency exchange rate or stock price serviced by
providers in communication networks. These information change every
20 moment irregularly without any advanced notice.

[0007]

Further, these newly received information are needed for
appropriate decisions at well time.

[0008]

25 Therefore, the conventional system which displays only
non-accessed messages is inconvenient, when former information such
as market price is not renewed and is to be confirmed again.

[0009]

Therefore, an object of the present invention is to improve the

above-mentioned conventional receiver in order to display easily also non-accessed messages or messages of which contents have not been read out yet. Another object of the invention is to display their reception times together with the contents of the messages.

5 [0010]

 [Means for Solving the Problem]

A selective radio paging receiver for receiving a message signal which follows a selective call signal of oneself, notifies the reception, and displays the contents of the message signal, is characterized in
10 that it comprises: a memory for storing the received message; automatic reset means and manual reset means for stopping the notification of the reception; memory control means for, if the notification of the reception has been stopped by said automatic reset means, adding an attribute which indicates that the messages is an
15 unread message to the message and storing the unread or already read message with a reception time to said memory; list display control means for displaying a plurality of both the unread messages with the attributes and the respective reception time and the already read messages with respective reception time in a list of a reverse
20 order of the reception time.

 [0011]

The selective radio paging receiver as set forth in claim 1, is also characterized in that it further comprises scroll means for selecting any one of the unread messages with the attributes and the already
25 read messages, together with the reception time thereof, from the unread message, the already read messages and respective reception times.

 [0012]

Said list display control means is characterized in that it displays

the unread messages with respective attributes and the already read messages, together with respective reception time, in parallel in the list.

[0013]

5 Said list display control means is characterized in that it displays the unread messages with respective attributes and the already read messages in the list, and displays one unread message with its attribute or one already read message which has been selected by said scroll means.

10 [0014]

The selective radio paging receiver is also characterized in that it further comprises: enlarged display control means for displaying, with changed character size, one unread message with its attribute or one already read message which has been selected by said scroll means
15 from the plurality of unread messages and already read messages displayed by said list display control means.

[0015]

Said enlarged display means is characterized in that it displays the enlarged unread message or the enlarged already read message in a
20 plurality of lines, wherein the reception time is displayed, without being enlarged, in a distinct area from the unread message and the already read message.

[0016]

The selective radio paging receiver is also characterized in that,
25 when the enlarged unread messages is selected from the plurality of unread messages with respective attributes and the already read messages which are displayed by said list display control means and displayed, the attribute is removed from said memory and the selected messages is stored as an already read message.

[0017]

[Embodiment of the Invention]

Referring to the drawings, a mode of embodiment of the present invention is explained. Figure 1 is a block diagram of a selective radio
5 paging receiver of the present invention.

[0018]

As shown in Figure 1, selective radio paging receiver 10 of the present invention comprises antenna 11, RX 12 for receiving, amplifying, and demodulating radio signals, wave form shaping circuit
10 13 for converting the demodulated signals into digital signals, memory 15 for storing messages and reception time in the sequential order of reception, read-only-memory 16 for storing a call number of the receiver itself, speaker 17, timer 18 for counting a prescribed time for paging, manual reset switch 19 for stopping the sound of speaker 17,
15 display control unit 20 for controlling the display of the messages and the reception time which are read out from memory 15, display unit 21 for displaying prescribed number of words and lines, for example, 22 words in each of 5 lines, or 11 words in each of 3 lines, display switch 22 for enlarging the messages, scroll switch 23 for selecting
20 messages, display timer 24 for displaying for a prescribed time interval, control unit 14 for controlling the whole receiver.

[0019]

Control unit 14 compares the call number received by the receiver with the call number stored in read-only-memory 16, and drives
25 speaker 17 to inform an arrival of message, on the basis of the number identification.

[0020]

The sound may be reset automatically or manually. Automatic reset (automatic reset) is implemented by control unit 14 which starts up

timer 18 at the beginning of ringing, and detects the time out, while manual reset is implemented by manual reset switch 19.

[0021]

Received messages together with their reception times are stored as
5 non-accessed messages in memory 15 under the automatic reset mode,
while they are stored as accessed messages together with their
reception times in memory 15.

[0022]

Accordingly, non-accessed and accessed messages are stored in the
10 sequential order as they are received. Only the non-accessed messages
are given an attribute which indicates that they are non-accessed
messages.

[0023]

Display control unit 20 reads out a prescribed number of the
15 messages in the reverse order of reception order (memory order),
without referring to the given attribute, and make display unit 21
display a message list (list display) accompanied with the given
attributes. Here, it is assumed as an example that four messages are
displayed in four lines using 22 words per line.

20 [0024]

Scroll switch 23 selects one of the displayed four messages by using
cursor display. The list of the fifth to eighth earlier messages may be
also displayed. Thus, a desired set of four messages is listed on the
display and one of the messages is selected by the cursor.

25 [0025]

In this case, non-accessed messages are easily selected, because they
are given the attributes. Therefore, accessed messages are easily read
out repeatedly and are easily confirmed.

[0026]

Further, the message which is selected by scroll switch 23 is enlarged on display 21, by display switch 22. The enlarging display of the message may be 11 capital letters in 2 lines accompanied by its reception time in a remaining line. Then, the enlarged message is
5 deprived of its attribute and is stored as an accessed message.

[0027]

The operation of display switch 22 causes timer 24 to start to restore the list on the basis of the timeout.

[0028]

10 In case of the manual reset, the received messages are enlarged, and are treated as accessed messages. On the basis of the timeout of timer 24, the enlarging display is replaced by the list display.

[0029]

Next, the display control of the messages will be explained with
15 reference to Figure 2 as well as Figures 1, 3 and 4.

Figure 2 is a flow chart for explaining the receiving and displaying radio messages. Figure 3 is an exemplary display of messages. Figure 4 is another exemplary display of the radio messages.

[0030]

20 When selective radio paging receiver 10 is in a waiting state (S101 in Figure 2), RX 12 receives and demodulate radio signals through antenna 11 (S102).

[0031]

Control unit 14 compares the call number stored in
25 read-only-memory 16 and the call number included in the demodulated signal which is converted to a digital signal by wave form shaping circuit 13. If the numbers are identical, control unit 14 sends out a call signal toward speaker 17 to notify a reception of message (S103) and starts up timer 18.

【0032】

Control unit 14 recognizes the manual reset mode by detecting an operation of manual reset switch 19 before the timeout of timer 18 (S104), thereby stores the received message in memory 15 as an
5 accessed message (S112), and then displays it in the enlarged format (S110).

【0033】

Further, control unit 14 orders display control unit 20 to start up timer 24.

10 【0034】

On the other hand, control unit 14 recognizes the automatic reset mode by detecting the timeout of timer 18 before an operation of manual reset switch 19, thereby stores the received message in memory 15 as a non-accessed message which is given the attribute
15 (S105).

【0035】

The list display in case of the automatic rest mode is such that contents and reception times of four messages stored in memory 15 are displayed in the four lines each of which contains a content and
20 reception time of each message (S106), as shown in Figure 3A. The contents which includes more than prescribed number of words is displayed partially. Here, the prescribed number is 23 characters.

The four sets of messages stored in memory 15 is displayed on display 21 in the reverse order of reception without regard to whether
25 accessed or non-accessed.

【0036】

As shown in Figure 3A, the first, third, and forth messages have not yet been accessed, while the second message has been already accessed. Here, the first message is the latest one.

【0037】

When one of these messages is selected by scroll switch 23, display control unit 20 indicates the selected message by using a cursor (S107) and starts up timer 24. As shown in Figure 3C, the second message is distinguished by the cursor display from the others.

【0038】

When display switch 22 is operated (on) before the timeout of timer 24 (S108), then timer 24 is restored again. At the same time, a selected non-accessed message is deprived of its attribute (S109), if the message selected by scroll switch 23 is an unread message, and is enlarged (S110), as shown in Figure 3C. At time, timer 24 is restarted.

【0039】

On the other hand, when the timeout of timer 24 is detected before the operating (on) display switch 22 (S108), then the processing step moves to S101, without reading out the message which was selected by scroll switch 23. Then, further, display switch 22 is reset and restored, and the receiver get ready to wait for next radio signal information.

【0040】

Further, when display switch 22 is turned on again before the timeout of timer 24 (S111), then steps S106, S107, S108, S109, and S110 are repeated.

【0041】

When the timeout of timer 24 is detected before the turn-on of display switch 22, then the processing step moves to S101 to stop receiving and controlling. When the manual reset by manual reset switch 19 is detected before the timeout of timer 18 (S104), then the accessed message which is stored in memory 15 (S112) is enlarged on display 21 (S110).

[0042]

In step S111, when the timeout of timer 24 is detected, then the processing step moves to S101, and the receiver gets ready to wait for next radio signal information.

- 5 Also in step S111, when display switch is turned on before the timeout of timer 24, then the processing step moves to S106 to repeat steps S107, S108, S109, and S110.

[0043]

- 10 When the timeout of timer 24 is detected before the turn-on of display switch 22 in step S111, then the processing step moves to S101, and the receiver gets ready to wait for next radio signal information.

[0044]

- 15 Next, referring to Figures 3 and 4, the displays of messages are explained. Figure 3 is a set of first exemplary displays of contents of messages and their reception times. Figure 3(A) is a list display, wherein a message display area is separated from the reception time display area, and messages and respective reception times are displayed. The message displayed in the first line is the latest message (first message) and the messages as time regresses are in
20 second, third and fourth lines. The messages in first, third and fourth lines are given attributes which indicate they are unread messages. It is a list display of messages at step S106 of Figure 2.

[0045]

- 25 Figure 3(B) shows that the latest received message is enlarged when the display switch is turned on, and it corresponds to the enlarged message display at step S111 in Figure 2.

[0046]

The cursor selection display as shown in Figure 3(C) is executed, when scroll switch 23 selects the second latest message (second

message) in step S106, after the execution of the enlarged display of the first message. Users realize by seeing the cursor selection display that the latest message in the first line is deprived of the attribute and is stored as an accessed message. It corresponds to step S106 in
5 Figure 2.

[0047]

Thus, a non-accessed message is deprived of its attribute and is stored as an accessed message.

[0048]

10 Figure 4 is a second example of display in which messages and respective reception times are displayed separately.

Figure 4(A) is a list display, in which a message display area and a reception time display area are separated, and only the reception time of the message which has been selected by the scroll switch is
15 displayed on the reception time display area.

[0049]

The message displayed in the first line is the latest message (first message) and the messages as time regresses are in second, third and fourth lines. The messages in first, third and fourth lines are given
20 attributes which indicate they are unread messages. It is a list display of messages at step S106 of Figure 2.

[0050]

The message display area is expanded by limiting the number of reception times to be displayed and by displaying the reception times
25 separately.

[0051]

Figure 4(B) is an enlarged display of the latest message selected by the turn-on of display switch 22 executed in step S111.

[0052]

The cursor selection display as shown in Figure 4(C) is executed, when scroll switch 23 selects the second latest message (second message) in step S106, after the execution of the enlarged display of the first message. Users realize by seeing the cursor selection display
5 that the latest message in the first line is deprived of the attribute and is stored as an accessed message. It corresponds to step S106 in Figure 2.

[0053]

[Effect of the Invention]

10 According to the present invention, received messages are given attributes which indicate that they are non-accessed messages or messages not yet read out, and are stored in the memory means in the order of reception, when the call notifications are stopped by the automatic reset means. Likewise, received messages are stored in the
15 memory means as accessed messages, when the call notifications are stopped by the manual reset means. Both of the accessed and non-accessed messages in the memory means are read out in the reverse order of reception, and are displayed in a form of list. Further, only one of the messages selected from the list is displayed together
20 with its reception time by enlarged characters. Therefore, a plurality of messages and their reception times are confirmed at one time on the above-mentioned display.

[0054]

Further, it is easy to know whether a message is accessed, or
25 non-accessed, even when accessed and non-accessed messages are mixed in a display. This is because the attribute mark is attached only to the non-accessed messages.

[0055]

Further, it is easy to read the contents of messages, owing to the

enlarged display.

[0056]

Furthermore, the degree of emergency and importance of non-accessed messages can be immediately judged, because it is also
5 easy to confirm the reception times.

[Brief explanation of the drawings]

[Figure 1]

A block diagram of a selective radio paging receiver of the present invention.

10 [Figure 2]

A flow chart for explaining the reception and display of messages.

[Figure 3]

A list display in the first exemplary display of message. (A) is a list display. (B) is an enlarged message display. (C) is a list display in a
15 case where an unread message is largely displayed and the attribute thereof is removed, and the message is displayed as an already read message.

[Figure 4]

A list display in the second exemplary display of message. (A) is a
20 list display. (B) is an enlarged message display. (C) is a list display in a case where an unread message is largely displayed and the attribute thereof is removed, and the message is displayed as an already read message.

[Explanation of reference numerals]

25 10 selective radio paging receiver
11 antenna
12 rx
13 wave form shaping circuit
14 control unit

- 15 memory
- 16 read-only memory
- 17 speaker
- 18 timer
- 5 19 manual reset switch
- 20 display control unit
- 21 display unit
- 22 display switch
- 23 scroll switch
- 10 24 timer

[Name of Document] Abstract

[Abstract]

[Purpose] To display a plurality of unread messages and already
read messages, together with attributes which indicates whether or
5 not each message is unread or already read, and to make it easy to
locate, read and display an unread message.

[Construction] If a call notification is automatically reset by timer
18, a received message is given with an unread attribute and treated
as an unread message. If the call notification is manually reset by
10 switch 19, a received message is treated as already read message.
Unread messages and already messages are stored in memory 15,
together with respective reception times. The unread messages and
already messages are displayed in a list on display 21 in a order
reverse to the reception order, together with respective reception
15 times. An arbitrary message is selected by switch 23 from the unread
messages and the already read messages in the list, and the selected
unread message or the selected already read message is largely
displayed with characters of which size is changed, together with its
reception time. After an unread message is largely displayed, the
20 attribute thereof is removed and the message will be stored as an
already read message.

[Representative Drawing] Figure 1

FIG. 1
SELECTIVE RADIO PAGING RECEIVER

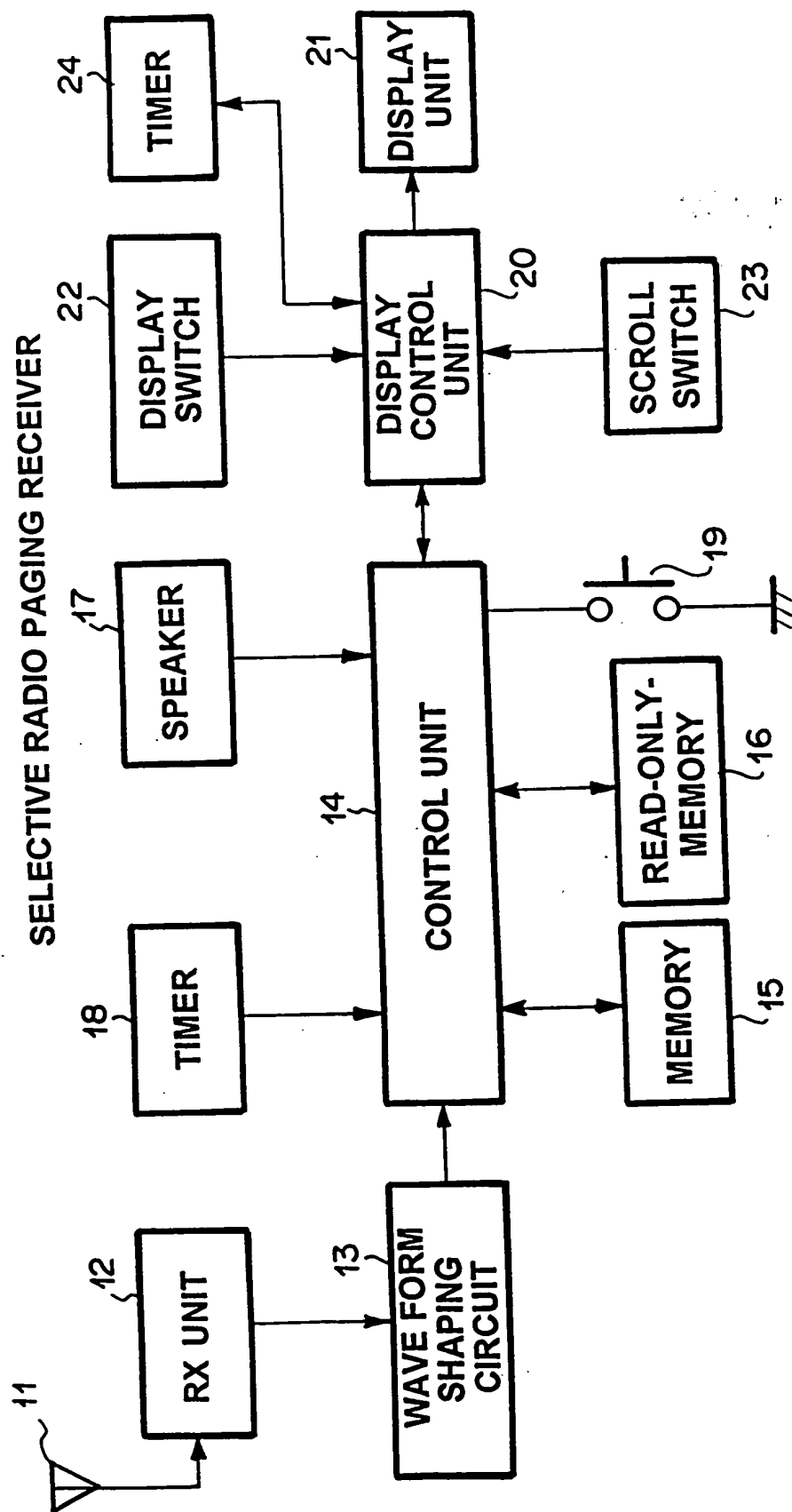


FIG. 2

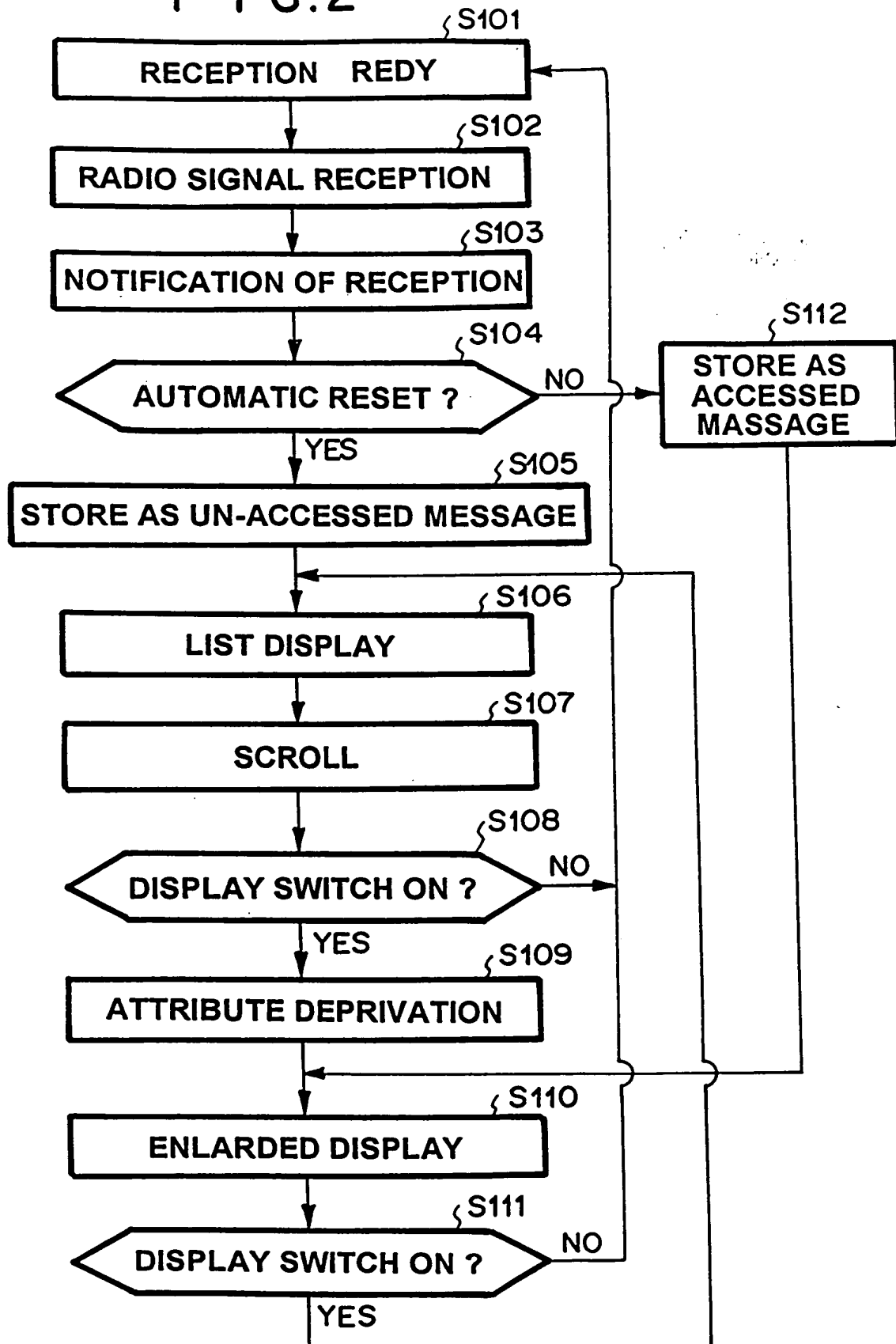


FIG. 3

MESSAGE DISPLAY AREA

RECEPTION TIME DISPLAY AREA

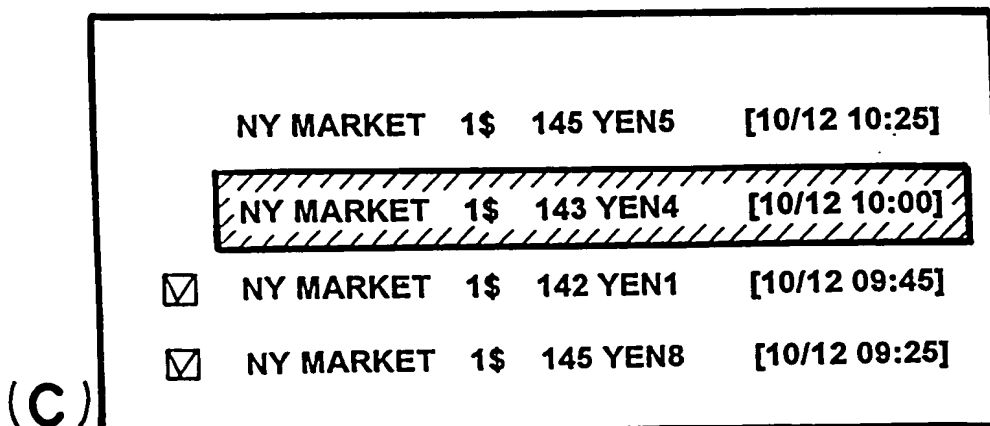
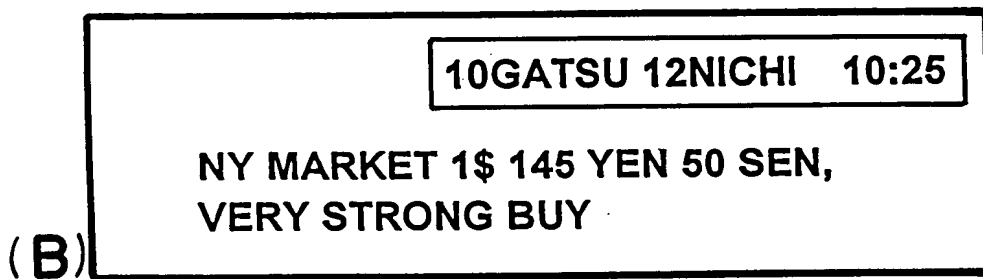
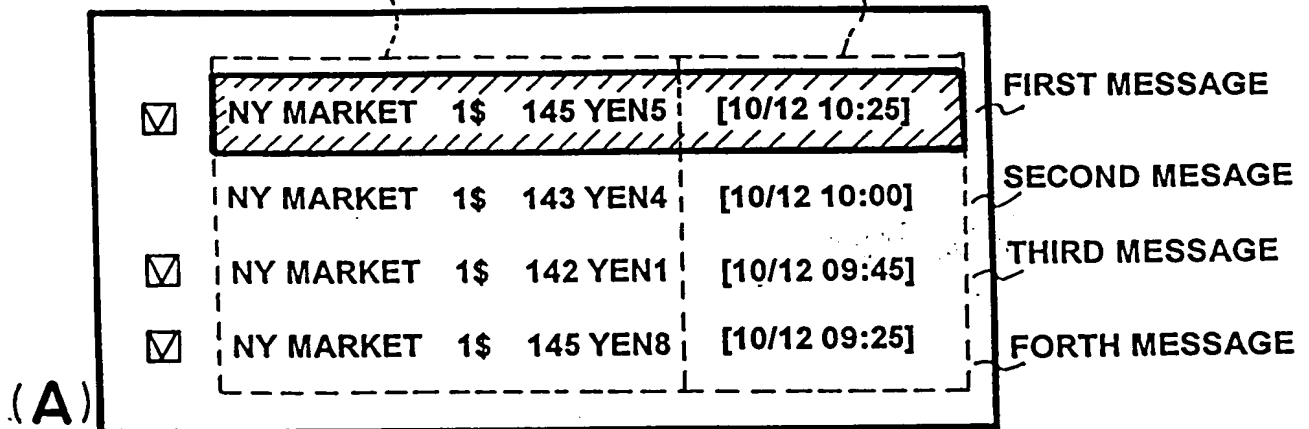


FIG. 4

RECEPTION TIME DISPLAY AREA

(A)

10GATSU 12NICH I 10:25		
<input checked="" type="checkbox"/>	NY MARKET 1\$ 145YEN 50SEN, EXTREMELY STRONG BUY	FIRST MESSAGE
	NY MARKET 1\$ 143 YEN 40SEN	SECOND MESSAGE
<input checked="" type="checkbox"/>	NY MARKET 1\$ 142 YEN 10SEN	THIRD MESSAGE
<input checked="" type="checkbox"/>	NY MARKET 1\$ 145 YEN 80SEN, DEVATATING SELL	FORTH MESSAGE

(B)

10GATSU 12NICH I 10:25	
NY MARKET 1\$ 145 YEN 50 SEN, EXTREMELY STRONG BUY	

(C)

10GATSU 12NICH I 10:00	
NY MARKET 1\$ 145YEN 50SEN, EXTREMELY STRONG BUY	
	NY MARKET 1\$ 143 YEN 40SEN
<input checked="" type="checkbox"/>	NY MARKET 1\$ 142 YEN 10SEN
<input checked="" type="checkbox"/>	NY MARKET 1\$ 140 YEN 80SEN, DEVASTATING SELL